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What drives product-service integration? An abductive study of decision-makers' motives and value strategies

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ABSTRACT

Many firms struggle to successfully translate corporate strategy into value-added solutions for customers by integrating products and services. A particular hurdle is the intrinsic motivation of the people in charge. This study contributes to the microfoundations of servitization literature by exploring what motives and strategies drive decision-makers to pursue product-service integration (PSI). Given the fragmented state of the literature, we follow an abductive approach. First, applying a behavioral strategy lens, we identify the theoretical building blocks to construct a conceptual framework. Next, we collect data of 178 small, Belgian firms to perform an exploratory quantitative analysis. Finally, we develop theory based on the results. Specifically, we find that the need for achievement and affiliation are both directly and positively associated with PSI. Also, achievement-driven people are likely to pursue PSI, originating from a product leadership position. Finally, the power motive is positively associated with operational excellence, but not with PSI.

1. Introduction

Firms increasingly combine products and services into integrated, value-added solutions for customers—this transformation is commonly referred to as "servitization" (Garcia Martin, Schroeder, & Ziaee Bigdeli, 2019; Vandermerwe & Rada, 1988). Although the number of empirical papers on servitization over the past decade grew exponentially, the research field is theoretically still largely in a developing phase (Kowalkowski, Gebauer, & Oliva, 2017). Thus far, the focus has mainly been on how firms (not people) achieve growth through product-service integration (PSI), for instance by creating unique configurations of resources and capabilities that support different types of offerings (Raddats, Kowalkowski, Benedettini, Burton, & Gebauer, 2019; Rönnberg Sjödin, Parida, & Kohtamäki, 2016). Today, little is known about the microfoundations of servitization (Lenka, Parida, Sjödin, & Wincent, 2018; Valtakoski, 2017), meaning the influence of individual-level factors on firm-level service decisions, actions and outcomes. The literature only offers insight in *firms*' motivations for servitization (Raddats, Baines, Burton, Story, & Zolkiewski, 2016), but it has remained rather silent on why *people* integrate products and services (Lenka et al., 2018).

Given the powerful microfoundations movement in strategy and organization theory (Felin, Foss, & Ployhart, 2015), we believe time is due to deepen our understanding of the micro-drivers of servitization. What is more, following Rabetino, Kohtamäki, and Gebauer (2017), we position PSI as a logical consequence of a firm's corporate value strategy, such as product leadership or customer intimacy (Treacy & Wiersema, 1993). Which value strategy is more prominently linked with servitization, however, is largely unknown, as different value offerings from low to high levels of servitization are possible (Brax & Visintin, 2017). This study therefore extends the current literature by addressing the following two research questions: (1) What motives drive decision-makers to integrate products and services into value-added solutions for customers? And: (2) Do people driven by different motives pursue PSI originating from different strategic value positions?

To answer these questions, we apply a behavioral strategy lens

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(Powell, Lovallo, & Fox, 2011), which merges insights from cognitive and social psychology with strategic management theory and practice to develop a rich microfoundational perspective. Indeed, because "the individual is always the basic strategic factor of the organization" (Barnard et al., 1968, p. 139), we must understand her/him to fully explain a firm's strategic positioning and concurrent strategic choices (Felin & Foss, 2005). Using a psychological approach to explain the implementation of service-based strategies has been suggested before (Rabetino et al., 2017). By bridging the field of servitization with the advanced behavioral tradition in strategic management, we not only uncover what motives drive decision-makers to pursue PSI, but we may also help explain the variety in firms' value strategies. Contrary to prior studies that consider the fit between different value strategies and firms' external business environment (Gebauer, 2008; Morgan, Anokhin, & Wincent, 2019), this study moves closer to "the heart" of servitization by considering potential fits with people's internal motives and preferred value strategies.

Methodologically, we use an abductive approach to hypothetico-deductive research, which refers to the process of reasoning from data to develop initial hypotheses as plausible explanations (Behfar & Okhuysen, 2018; Peirce, 1932). Abduction is suitable for research domains where the different theoretical building blocks of a conceptual model or theory are known, but where their connections are not (Dubois & Gadde, 2002). It implies that the different theoretical elements are discussed first, after which they are tested quantitatively (e.g., Dikova, van Witteloostuijn, & Parker, 2017). Only *after* this quantitative test, further theoretical reasoning and interpretation of the results—by the researchers as active reasoners in building connections and telling the story—can take place (Locke, 2011). As such, abduction is a particularly suited method to advance the development of midrange theories (Birkinshaw, Healey, Suddaby, & Weber, 2014). Contrary to nascent theories that benefit mostly from a purely qualitative approach, and mature theories that benefit mostly from a purely quantitative approach (Edmondson & McManus, 2007), we strike a happy medium by opting for abduction. In what follows, we first elaborate further upon the added value of an abductive approach for our research aim, after which we discuss the theoretical building blocks of our theoretical model. After a quantitative test, we further fine-tune the theoretical model and develop ready-to-use hypotheses as plausible explanations for future research. Finally, we summarize this article's main theoretical contributions and its business implications.

2. Paper build-up: An abductive approach

Abductive reasoning refers to the process of studying results or facts as a starting point to formulate theory that may explain those results or facts (Peirce, 1932; Rahmani & Leifels, 2018). It contributes to the advancement of science by allowing for discovery through the exploration of data to produce plausible explanations (Behfar & Okhuysen, 2018). The provided explanations are developed based on one or several observations that function as a bridge to connect different theories in an attempt to develop hypotheses (Rahmani & Leifels, 2018; Richardson & Kramer, 2006). The goal is thus not to test ex-ante developed hypotheses, but to develop ex-post hypotheses using theoretical building blocks and a quantitative empirical test to do so (Behfar & Okhuysen, 2018). As a methodology, abduction lies somewhere between induction and deduction (Dubois & Gadde, 2002): Unlike inductive reasoning, abduction does not rely solely on empirical data to move from the specific to the more general, and unlike deductive reasoning, theoretical premises do not guaranty the results (Dikova et al., 2017). Instead, abduction involves the iterative dialogue between data and existing theories (Van Maanen, Sørensen, & Mitchell, 2007) and generates rather than tests hypotheses in order to explain phenomena (Shank, 1998).

The starting point of this study is the observation that servitization success depends on people's motivation (Gebauer & Fleisch, 2007; Kreye, 2016; Ulaga & Loveland, 2014), and that PSI originates from a firm's value strategy, such as customer intimacy or product leadership (Matthyssens & Vandenbempt, 2008; Rabetino et al., 2017). Even though we know from a behavioral strategy lens that human motivation influences strategic decision-making (Powell et al., 2011), there is little knowledge on what motives drive decision-makers to integrate products and services into value-added solutions for customers (Gebauer & Fleisch, 2007; Lenka et al., 2018), and on which motive relates to which value strategy (Treacy & Wiersema, 1993). In other words, we do not know how our three building blocks—that is, PSI, motives and value strategies—relate to each other. With this study, we aim to infuse the servitization field with insights from behavioral strategy to uncover the micro-drivers of servitization associated with firms' value strategies.

Following Dikova et al. (2017), we apply abduction in three steps: identifying the theoretical buildings, exploratory quantitative analysis, and theory development. First, we review the literature on servitization and behavioral strategy to identify *ex ante* theoretical building blocks of *ex post* hypotheses through limited deduction, constructing a preliminary conceptual framework for further analysis. Next, we collect data and execute a comprehensive quantitative analysis as a form of exploratory induction to explore the relationships among the selected elements. A quantitative analysis allows us to confirm (or reject) whether the proposed relationships between the selected theoretical building blocks actually exist, and to some extent also compare them. Finally, based on the empirical findings and the consulted literature, we fine-tune the conceptual model and develop specific hypotheses, which may serve as input for further investigation in later studies.

This abductive approach to hypothetico-deductive inquiry whereby researchers play a more active role in exploring data, providing explanations, and building connections between different studies, is stimulated in organization science (Behfar & Okhuysen, 2018; Locke, 2007). Furthermore, we draw from previously reported cases as well our own work to provide illustrations, which is common in the servitization literature (e.g., Frank, Mendes, Ayala, & Ghezzi, 2019; Kowalkowski & Kindström, 2014) and highly encouraged to shape the story of the study (Behfar & Okhuysen, 2018).

3. Literature review: Theoretical building blocks

3.1. Servitization and PSI

Servitization refers to the strategic transition of firms from being suppliers of basic products and services towards becoming providers of integrated, value-added solutions for customers (Matthyssens & Vandenbempt, 2008; Vandermerwe & Rada, 1988). The core of servitization research focuses on manufacturers of industrial products such as airplane engines and truck tires (Kowalkowski, Gebauer, Kamp, et al., 2017), but other firms are moving towards PSI as well. For example, independent retailers and distributors are increasingly offering customized solutions that better suit clients' needs (Hullova, Laczko, & Frishammar, 2019); in the agricultural sector, pesticide firms have become responsible for managing the health of farms' crops (Pereira, Carballo-Penela, Guerra, & Vence, 2018); and in the logistics sector, transportation firms are cooperating with other actors to create fully-integrated logistics models (Bigdeli, Bustinza, Vendrell-Herrero, & Baines, 2017; Hedvall, Jagstedt, & Dubois, 2019). As already described by Vandermerwe and Rada (1988, p. 314) in their original paper, servitization is an important business trend that is "pervading almost *all* industries" (italics added).

PSI is often positioned as a strategic choice following a firm's value proposition (Matthyssens & Vandenbempt, 2008; Rabetino et al., 2017), and has been associated with many strategic, financial and marketing advantages (Baines, Lightfoot, Benedettini, & Kay, 2009; Raddats et al., 2016). Firms that include PSI into their corporate strategy are not only expected to increase their competitive advantage, especially in commoditized markets (Matthyssens & Vandenbempt, 2008), but they are

also considered to achieve superior financial performance (Sjödin, Parida, & Kohtamäki, 2019), such as higher revenues (Böhm, Eggert, & Thiesbrummel, 2017), profits (Eggert, Hogreve, Ulaga, & Muenkhoff, 2014), and employment figures (Crozet & Milet, 2017). However, when investments in new solutions do not immediately generate corresponding returns (Fang, Palmatier & Steenkamp 2008; Parida, Ronnberg-Sjodin, Wincent, & Kohtamäki, 2014), firms often cut their losses and turn away (Gebauer, Fleisch, & Friedli, 2005).

A fundamental obstacle for the effective implementation of PSI is the motivation of the people in charge (Gebauer & Fleisch, 2007; Kreye, 2016). Particularly decision-makers with cognitive barriers, such as an overemphasis on products' tangible features or an aversion of the risks that often come with providing solutions, prevent firms from servitizing successfully (Gebauer et al., 2005). For example, there is the case of an air-compressor manufacturer that was reluctant to change its current business model out of fear for shareholders' reactions (Coreynen, Matthyssens, De Rijck, & Dewit, 2018). Also, firms implementing the new PSI strategy often experience internal resistance among employees, for instance due to changes in the overall way of working and the need to acquire new skills (Lenka et al., 2018). This issue has been portrayed in the example of a metalwork company's sales team that needed to learn to how to sell value rather than just metal parts, and also how to build and maintain customer relations (Coreynen, Matthyssens, & Van Bockhaven, 2017).

Alternatively, when managers and employees both recognize the potential of PSI as a type of value strategy to address customer problems and treat customers in a service-oriented way, they are more likely to see their firms' performance increase (Gebauer, Edvardsson, & Bjurko, 2010). In fact, when people are intrinsically motivated to provide services, meaning when they enjoy performing a task for its own sake, they perform better (Ulaga & Loveland, 2014) and also the quality of the delivered service increases (Kreye, 2016). Particularly managers play a key role in elevating firms' orientation towards service and, consequentially, enhancing their performance (Gebauer et al., 2010). Yet despite the current evidence, the literature till date remains scarce on what precise motives drive people to integrate products and services into value-added solutions for customers (Lenka et al., 2018), and how this relates to a firm's corporate value strategy (Rabetino et al., 2017). In the next sections, we adopt a behavioral strategy lens (Powell et al., 2011) to identify the other key theoretical building blocks and construct a conceptual framework that sheds light on the potential micro-drivers for servitization in relation to a firm's corporate value strategy.

3.2. Individual motives for servitization

Behavioral strategy combines insights from psychology and strategy in order to better understand how people's conscious and unconscious biases and preferences influence strategic decision-making (Powell et al., 2011). Different personality dimensions are key to develop the foundation for explaining heterogeneity among firms' strategies as well as their success (Felin, Foss, Heimeriks, & Madsen, 2012). One such stream of research emphasizes the central role of people's motives as antecedents of entrepreneurial decisions (Murnieks, Klotz, & Shepherd, 2020; Shane, Locke, & Collins, 2003), particularly because motivational factors are increasingly considered as important drivers of entrepreneurial action (Slabbinck et al., 2018; Wolff, Weikamp, & Batinic, 2018). Whereas personality traits offer insights into *how* people act or feel a certain way, the motivational perspective focuses on the *why* people act as such (Wolff et al., 2018).

McClelland (1987), one of the pioneering scholars to use a psychological perspective for explaining entrepreneurial behavior (Frese & Gielnik, 2014), identified the Big Three motives (Schultheiss & Brunstein, 2001). This theory forms the basis for much personality studies in entrepreneurship (Frese & Gielnik, 2014; Shane et al., 2003), strategy (Miller & Toulouse, 1985, 1986) and leadership research (Miner, 2005; Steinmann, Dörr, Schultheiss, & Maier, 2015). Following these traditions, we adopt McClelland (1987) motives as a starting point to add a behavioral lens to servitization research.

The *need for achievement* refers to the desire for mastering skills, accomplishment and pursuing high standards. People with high achievement want to accomplish difficult goals on their own terms and prefer that their work is evaluated based on their own efforts rather than anything or anyone else's (McClelland & Burnham, 2003). People with a high *need for affiliation* are mostly concerned with creating and maintaining good relations. They have a desire to feel accepted and appreciated and prefer collaboration over competition (Wolff et al., 2018). Finally, people driven by *the need for power* seek to control and influence people, for example through teaching and encouragement. They are more assertive in group discussions and more likely to be frustrated when they feel that they are not in control (McClelland, 1987; Winter, 1973).

In strategy research, it is shown that achievement-driven decision-makers are associated with pursuing market differentiation strategies, such as reaching customers through clever innovation, creative marketing and prestige pricing (Miller & Toulouse, 1986). This resonates with firms differentiating themselves from the competition by moving into value-added solutions (Matthyssens & Vandenbempt, 2008). They are also more likely to be bored by the challenge of reducing costs (Miller & Toulouse, 1986), which suits servitization as it requires sufficient investments, particularly in the early stages (Gebauer et al., 2005; Kastalli & Van Looy, 2013). However, decision-makers driven by the need for achievement are less prone to risk (McClelland & Watson, 1973), while servitization is considered a risky strategy for which the benefits may only come later (Fang, Palmatier & Steenkamp 2008; Visnjic, Wiengarten, & Neely, 2016). Additionally, they tend to favor centralized, highly-structured and well-integrated organizations to be able to better monitor, control and thus take credit for organizational performance (Miller & Dröge, 1986), whereas servitization may benefit more from decentralized organizations, depending on the type of service strategy (Gebauer, Edvardsson, Gustafsson, et al., 2010).

Alternatively, people driven by affiliation seem particularly suited for servitization because they perform well in customer interactions and service functions (ICMBA, 2002). They even tend to bend the rules to please customers (McClelland & Burnham, 2003). In the servitization literature, this tactic has been referred to as "bootlegging", and it is used by individual managers to overcome structural resistance against servitization in the firm (Lenka et al., 2018). For example, a business manager at a large stainless steel pump manufacturer developed his own sales approach focused on offering customers "peace-of-mind" (Shankar, Berry, & Dotzel, 2009), which was not fully supported by other departments of the organization (Coreynen et al., 2018). However, affiliative people can be ineffective managers because their main concern is being liked. Therefore, they are considered less successful in turning ideas into a concrete vision for others to follow (McClelland & Burnham, 2003), which is particularly important for implementing a service strategy (Gebauer et al., 2010). The need for affiliation alone may therefore not be enough, and some studies argue that managers are only successful when they score high on both affiliation and power (Steinmann et al., 2015).

Finally, people driven by power, contrary to their affiliative counterparts, are well-suited to increase firm productivity, because their main concern is getting things done by using their influence rather than by their own efforts (McClelland & Burnham, 2003). At first sight, power may not seem a valuable motivation for servitization, which is more related to developing new business opportunities through non-price based value offerings (Matthyssens & Vandenbempt, 2008) rather than improving internal efficiency. Yet, it could be relevant for particular service strategies related to cost leadership (Ulaga & Reinartz, 2011), where the supplier strives to outperform competitors and even customers in order to become the latter's outsourcing partner (Gebauer, 2008). For example, a metal work supplier became so efficient in making metal components that it started producing more fully-

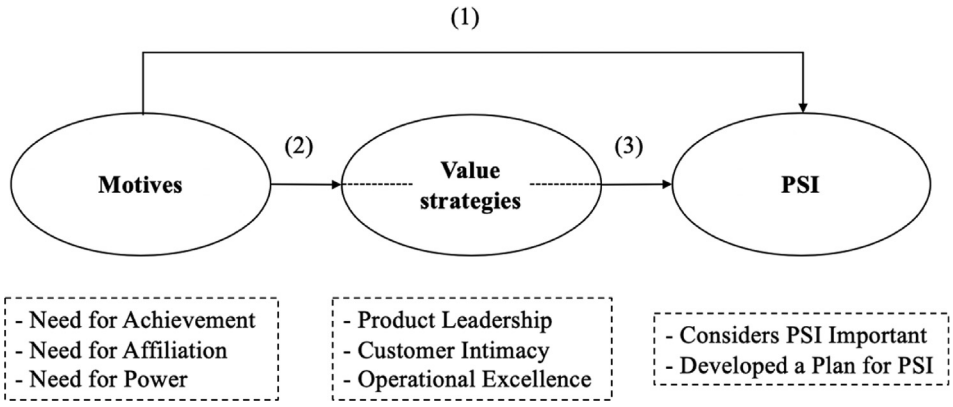

Fig. 1. Conceptual framework.

assembled solutions, such as bedframes, for particular customers (Coreynen, 2019).

3.3. Value strategies

Several frameworks have been introduced to differentiate between distinct strategic categories, such as Miles and Snow's strategy typology (Miles, Snow, Meyer, Coleman, & Henry, 1978) and Porter's three generic strategies framework (Porter, 1980). These categorizations explain how firms can differentiate from their competition, for instance by developing new products and services or tapping into new markets. Yet, because they consider strategy mostly from a provider's point of view, these frameworks fall short in explaining strategy from a customer-centric, marketing perspective (Rauch & Frese, 2000; Reimann, Schilke, & Thomas, 2010).

Alternatively, the value disciplines framework by Treacy and Wiersema (1993) shows three ways that firms can compete by offering customers different types of value. First, they can act as *product leaders* by continuously improving products and services through superior designs, functionalities and brands. Second, they can focus on *customer intimacy* by leveraging their unique knowledge about customers to create customized solutions and build loyal customer relationships. Third, they can achieve *operational excellence* by refining current processes to increase efficiency, reduce costs and provide customers value-for-money. Firms are advised to meet the minimum industry standard on all three aspects, yet commit to only one strategy in order to effectively implement all intricate practices associated with that particular strategy (Porter, 1980; Treacy & Wiersema, 1993).

The value disciplines framework is often referred to in the servitization literature to explain different types of service strategies (e.g., Matthyssens & Vandenbempt, 2008; Rabetino et al., 2017). First, well-known product leaders with a long track-record in innovating products and technologies are often described moving to advanced services in order to better secure their position in an increasingly competitive market (Kamp & Parry, 2017). For example, John Deere transformed from selling and servicing tractors to providing fully-connected and automated farming systems (Fang, Palmatier & Steenkamp 2008; Porter & Heppelmann, 2014). Other famous industry examples are Rolls Royce's power-by-the-hour and Xerox' pay-per-copy services (Kowalkowski, Gebauer, Kamp, et al., 2017).

Second, customer intimacy resonates with firms customizing their products to fit customers' specific needs (Kohtamäki & Partanen, 2016; Matthyssens & Vandenbempt, 2008) and also with service modularization (Gremyr, Valtakoski, & Witell, 2019). Here, providers leverage their unique knowledge about customers to provide them customized solutions (often beyond the core product or service) and build long-term relationships. For example, an insole manufacturer, on top of producing and delivering customized insoles, offers a range of other services for podiatrists, including software, training and also network opportunities (Coreynen et al., 2017). Another example is the manufacturer of contemporary office furniture that, on top of customizing furniture, also adopted a wide range of services such as advice (e.g., on office set-up), installation, repair and furniture recycling (Coreynen et al., 2018).

Third, operational excellence relates to several other demand-driven motivations for servitization, such as saving money for customers by taking care of particular tasks and also assuming their risk by maintaining ownership over the product (Raddats et al., 2016). Here, firms combine product and service differentiation with cost leadership (Ulaga & Reinartz, 2011) to offer attractive prices for operational services, such as maintenance and logistics (Gebauer, 2008; Matthyssens & Vandenbempt, 2008). They act as caretakers so customers can outsource activities and better focus on their core business (Oliva & Kallenberg, 2003). For example, Michelin offers tire management solutions to transportation firms for their fleets of vehicles, so they do not need to worry about controlling costs, preventing breakdowns and following-up on administration (Renault, Dalsace, & Ulaga, 2010).

3.4. Conceptual framework

Based on the above theoretical building blocks, we argue that decision-makers driven by different motives opt for different types of value strategies, venturing into PSI—if at all. In other words, we propose that whether decision-makers implement PSI depends on the relationship between their motivation (i.e., the need for achievement, affiliation, and power) and their firm's value strategy (i.e., product leadership, customer intimacy, and operational excellence). This proposition involves mediation (Venkatraman, 1989), which refers to the causal logic where the relationship between a predictor variable (i.e., motivation) and an outcome variable (i.e., PSI) can be explained by their indirect relationship through a third variable: the mediator (i.e., value strategy) (Field, 2009).

Fig. 1 illustrates the proposed preliminary conceptual mediation framework with the identified elements added. In the empirical analysis, we explore all potential links between decision-makers' motives, firms' value strategies, and the likelihood that they will engage in PSI. We do so by examining the following relationships:

1) Motives and PSI;
2) Motives and value strategies; and
3) The mediation effect of different motives on PSI through different value strategies.

We analyze these relationships in the context of micro to small-sized firms where decision-makers exert a substantial influence on firms' strategies and behavior (Boone, Brabander, & van Witteloostuijn, 1996; Rauch & Frese, 2000). Also, we take into account that decision-makers may consider PSI important, but also that they may not have developed

a plan to really implement it as an outcome of their firm's corporate strategy accordingly.

4. Empirical test

4.1. Data collection

The data stems from a local research project on ambitious entrepreneurship in Belgium whereby professional coaches offer strategic and personal advice to decision-makers based on the results of several surveys developed by our academic team. One survey focuses on the personality of the decision-maker and her/his motives, and another on the firm, its strategy and consideration of several business trends, including PSI. Between October of 2016 and February of 2018, 238 decision-makers from different firms participated in the study—the vast majority being firm (co–)owners (89.5%)—of which 178 cases (listwise) provided valid information to conduct the empirical test. Participants were asked to give the name(s) and VAT number(s) of their firm(s), so we could obtain secondary information through Graydon, an independent financial and legal information services provider, such as the sector, size and age of the firm.

As pointed out in the introduction, servitization is pervading almost *all* industries, from manufacturers and distributors to service providers (Vandermerwe & Rada, 1988). Therefore, our sample covers a wide range of sectors, including wholesale and retail trade (33.0%), professional, scientific and technical activities (15.1%), manufacturing (14.6%), construction (10.8%), information and communication (7.0%), service activities (4.9%), administrative and support service activities (4.3%), and eight other sectors (10.2%). In terms of firm size, the firms in our sample range from self-employed entrepreneurs (27.1%) to micro-firms with < 10 employees (59.3%) and small-sized firms with 10 to 50 employees (13.5%). This range makes our sample particularly suited for two reasons. First, in smaller organizations, decision-makers have an enormous influence on the firms' strategic direction (Boone et al., 1996; Rauch & Frese, 2000). Second, according to a recent study on manufacturers' performance, firms with < 50 employees benefit most from servitization (Crozet & Milet, 2017). Finally, in terms of age, the firms in our sample are < 5 years old (16.6%), 5 to 9 years (23.6%), 10 to 19 years (34%), 20 to 29 years (11.7%), 30 to 39 years (9.0%), and 40 years or older (5.1%).

4.2. Measures

4.2.1. Dependent variables.

Participants reflected on a list of several major trends, including the integration of products and services into solutions for customers. Per trend, they were asked two specific questions: (1) Whether they consider the trend important for their firm (from 1 = 'not at all important' to 5 = 'extremely important'), and (2) whether they have developed a plan for it (from 1 = 'strongly disagree' to 5 = 'strongly agree'). This gives us two new servitization variables: PSI Importance (PSIM) and Plan (PSIP), for which we run separate analyses.

The distinction between PSIM and PSIP allows us to compare whether the relationship between different motives and strategic-thinking (i.e., PSIM) differs from actual strategic decision-making (i.e., PSIP). Based on prior interviews, we find that some decision-makers are well capable of turning strategic intensions into actions—they consider PSI important and can show concrete plans for it—whereas others, who might claim PSI is important, in practice can show little evidence of actual plans for it. According the literature, considering decision-makers' different motives may shed further light on this distinction (e.g., McClelland & Burnham, 2003).

4.2.2. Independent variables.

The Need for Achievement (N-Ach), Affiliation (N-Aff) and Power (N-Pow) are operationalized through 11 statements per motive adopted from the Personality Research form (PRF; Jackson, 1984). The PRF is a self-report inventory of motivational needs that is often used to assess people's motives (Schultheiss, Yankova, Dirlikov, & Schad, 2009). Respondents were asked to rate each statement on a 7-point Likert scale (from 1 = 'strongly disagree' to 7 = 'strongly agree'). In confirmatory factor analysis, three factors emerged: an eight-item N-Ach scale (α = 0.61), a ten-item N-Aff scale (α = 0.84), and a ten-item N-Pow scale (α = 0.76). All items conceptually load correctly on the three factors (Appendix A), and the lowest Cronbach α is just above the lower limits of acceptability of 0.60 (Hair, Black, Babin, & Anderson, 2009). The motives were calculated by averaging the scores of the remaining items.

4.2.3. Mediating variables.

The three value strategies—i.e., Product Leadership (PL), Customer Intimacy (CI), and Operational Excellence (OE)—are based on the multi-item scale of Reimann et al. (2010). They are operationalized through 16 statements in total, related to refining existing products and services through superior designs and functionalities, maintaining customer relationships by providing customized offerings, and lowering costs by improving efficiency in product/service creation and delivery. Respondents were asked to rate each statement on a 5-point Likert scale (from 1 = 'strongly disagree' to 5 = 'strongly agree'). In confirmatory factor analysis, twelve items led to three factors: a four-item PL scale (α = 0.77), a five-item CI scale (α = 0.60), and a three-item OE scale (α = 0.80). All items conceptually load correctly on the three factors (Appendix B), and the lowest Cronbach α is just above the lower limits of acceptability of 0.60 (Hair et al., 2009). The value strategies were calculated by averaging the scores of the remaining items.

4.2.4. Control variables.

At the individual level we include Gender, Age and Education. Gender (Gen) is a dichotomous variable (1 = 'male'; 2 = 'female'), Age ranges from 23 to 70, and Education (Edu) is an ordinal variable with six categories (1 = 'no school', 2 = 'primary school', 3 = 'secondary school'; 4 = 'bachelor's degree', 5 = 'master's degree', and 6 = 'doctoral degree').

At the firm level, Age and Size are obtained through Graydon. Firm Age (F-Age) is a continuous variable calculated by subtracting the year of incorporation from the year when the participants started the survey. In our sample, it ranges from zero to 67 years. Firm Size (F-Size) is an ordinal variable with six separate range of number-of-employees categories (0 = 'no employees', 1 = '1 to 4′, 2 = '5 to 9′, 3 = '10 to 19′, 4 = '20 to 49′, 5 = '50 to 99′). Finally, to check whether firms are currently providers of mostly products or services, we asked about their product-service orientation (F-PSO). F-PSO is a nominal variable determined by the question "Which of the following descriptions best fits your firm?" (1 = 'product-oriented'; 2 = 'mostly product-oriented supported by additional services'; 3 = 'both product and service oriented'; 4 = 'mostly service-oriented supported by additional products'; 5 = 'service-oriented'). This variable captures the variety among firms in terms of their position on the product-service continuum (Oliva & Kallenberg, 2003). When comparing F-PSO with firms' sector, we see that nearly all major sectors in our sample cover all five PSO categories, and that the majority of firms consider themselves both product and service-oriented (Appendix C).

4.3. Analysis

We run hierarchical linear regressions in SPSS and the PROCESS custom dialog box for mediation modelling (Hayes, 2013). Obtaining generalizability of the results requires a ratio of observations to the independent variable of at least five to one, and preferably a ratio of fifteen to one (Hair et al., 2009). As we work with a maximum of nine variables, the required number of observations is minimally 45 and preferably 135. For our final sample, we consider the cases for which all

Table 1
Descriptive statistics and bivariate correlations.

		Mean	SD	1	2	3	4	5
1.	PSIM	3.36	1.24	1				
2.	PSIP	3.33	1.23	0.71**	1			
3.	PL	3.43	0.79	0.31**	0.35**	1		
4.	CI	3.88	0.63	0.16*	0.18*	0.18*	1	
5.	OE	3.36	0.83	−0.05	0.00	0.17*	0.26**	1
6.	N-Ach	4.70	0.74	0.15*	0.17*	0.21**	0.27**	0.03
7.	N-Aff	4.69	0.97	0.15*	0.14	−0.04	0.12	0.10
8.	N-Pow	4.06	0.83	0.01	0.04	−0.05	0.07	0.182*
9.	Gen	1.33	0.47	0.00	−0.02	−0.04	0.08	−0.05
10.	Age	42.40	9.25	−0.08	0.03	−0.02	0.08	0.03
11.	Edu	4.05	0.81	−0.01	−0.07	0.08	0.08	0.05
12.	F-Age	15.67	13.48	−0.08	−0.06	−0.15*	−0.09	−0.06
13.	F-Size	1.31	1.11	0.04	0.01	0.08	0.06	0.08
14.	F-PSO	3.01	1.25	0.06	0.01	0.09	0.21**	0.00

	6	7	8	9	10	11	12	13	14
1.									
2.									
3.									
4.									
5.									
6.	1								
7.	0.02	1							
8.	0.26**	0.16*	1						
9.	−0.03	0.01	−0.28**	1					
10.	−0.22**	0.00	−0.18*	0.04	1				
11.	0.18*	0.04	−0.04	0.05	−0.04	1			
12.	−0.16*	−0.12	−0.20**	0.01	0.10	0.00	1		
13.	0.02	−0.01	0.09	−0.14	−0.04	−0.04	0.37**	1	
14.	0.16*	0.01	0.13	0.06	−0.10	0.12	−0.34**	−0.20**	1

Notes: Correlations significant at the 0.05 level (2-tailed) are marked by *, and at the 0.01 level by **. Sample size = 178 (listwise).

the variables are available, which gives a final sample of 178 cases (listwise). The remaining data are Missing Completely at Random (MCAR) ($p = 0.177$).

Table 1 shows the descriptive statistics and the bivariate correlations among the variables. The average participant is 42 years old, has a bachelor's degree, and two in three participants in the sample are male. The average firm is nearly 16 years old, offers employment to approximately four to nine employees, and offers both products and services to customers. To reduce the risk of multicollinearity, only independent variables with a bivariate correlation of maximum 0.7 are included in the same model. The highest correlation is between PSIM and PSIP ($r = 0.71, p < 0.01$), which we take separately as dependent variables. The maximum variance inflation factor (*VIF*) is 1.37, which is well below the suggested maximum value of 10 (Neter, Kutner, Wasserman, & Nachtsheim, 1996).

Table 2 shows the results of the hierarchical regressions of the three motives on PSIM (Model 1a) and PSIP (Model 1b) as well as the three value strategies (Models 2a-c) as the dependent variable. The *F*-statistics are only significant for the models with PL (Model 2a) and CI (Model 2b), and the R^2 ranges from 4.6 to 12.0% for the models with OE (Model 2c) and CI, respectively.

Regarding servitization, N-Ach is positively associated with both PSIM ($b = 0.26, p = 0.05$) and PSIP ($b = 0.35, p < 0.01$), and N-Aff is also positively associated with both PSIM ($b = 0.22$, $p = 0.04$) and PSIP ($b = 0.17$, $p = 0.07$). Though the association with PSIP seems considerably weaker for N-Aff than N-Ach ($b = 0.17 < 0.35$), their unstandardized coefficients are not significantly different. Finally, there is no significant association between N-Pow and PSIM (b = -0.17, $p = 0.15$) nor PSIP (b = -0.09, $p = 0.47$). Regarding value strategies, N-Ach is positively associated with both PL ($b = 0.21, p = 0.01$) and CI ($b = 0.21, p < 0.01$), there is no association between N-Aff and any of the three strategies, and N-Pow is positively associated with OE ($b = 0.18, p = 0.03$) and negatively with PL (b = -0.15, $p = 0.05$).

Tables 3 and 4 summarize the results of the indirect effects of the

Table 2
Direct effects of motives on PSI (1a-b) and value strategies (2a-c).

Model	1a	1b	2a	2b	2c
Outcome	PSIM	PSIP	PL	CI	OE
	B	B	B	B	B
Constant	2.245*	1.726	3.136**	1.743**	2.162**
	(1.119)	(1.122)	(0.710)	(0.570)	(0.782)
Control variables					
Gen	−0.038	−0.032	−0.063	0.146	0.048
	(0.199)	(0.201)	(0.126)	(0.101)	(0.139)
Age	−0.006	0.007	0.002	0.009†	0.005
	(0.010)	(0.010)	(0.006)	(0.005)	(0.007)
Edu	−0.067	−0.166	0.032	0.014	0.068
	(0.113)	(0.113)	(0.072)	(0.058)	(0.079)
F-Age	−0.007	−0.004	−0.012*	−0.002	−0.003
	(0.008)	(0.008)	(0.005)	(0.004)	(0.005)
F-Size	0.087	0.014	0.114*	0.066	0.058
	(0.091)	(0.091)	(0.057)	(0.046)	(0.063)
F-PSO	0.043	−0.007	0.010	0.070†	−0.035
	(0.077)	(0.078)	(0.049)	(0.039)	(0.054)
Direct effects					
N-Ach	0.259†	0.348**	0.214*	0.210**	−0.042
	(0.132)	(0.132)	(0.083)	(0.067)	(0.091)
N-Aff	0.220*	0.173†	−0.043	0.057	0.041
	(0.093)	(0.093)	(0.059)	(0.047)	(0.065)
N-Pow	−0.174	−0.087	−0.151*	−0.001	0.181*
	(0.120)	(0.120)	(0.077)	(0.065)	(0.085)
F-statistic	1.433	1.319	2.110*	2.619**	0.930
R^2	0.068	0.064	0.099	0.120	0.046
R^2 change	0.050*	0.053*	0.051*	0.059*	0.031
N	187	185	183	183	182

Notes: Significance levels < 0.10 marked by †, < 0.05 by *, and < 0.01 by **. Unstandardized coefficients. Standard errors in parentheses. All *VIF* < or = 1.367.

Table 3
Indirect effects of motives through value strategies on PSIM (3a).

	PL	CI	OE
N-Ach	0.079	0.048	0.000
	[-0.001, 0.186]	[-0.008, 0.134]	[-0.034, 0.021]
N-Aff	−0.029	0.014	−0.007
	[-0.097, 0.023]	[-0.013, 0.051]	[-0.036, 0.016]
N-Pow	−0.054	0.014	−0.014
	[-0.144, 0.015]	[-0.021, 0.071]	[-0.075, 0.026]

Notes: Unstandardized coefficients. Bootstrapped confidence interval in brackets. Sample size = 182 (listwise) for PL and CI and 181 (listwise) for OE.

Table 4
Indirect effects of motives through value strategies on PSIP (3b).

	PL	CI	OE
N-Ach	0.099	0.063	0.000
	[0.001, 0.216]	[-0.011, 0.162]	[-0.030, 0.015]
N-Aff	−0.037	0.018	−0.002
	[-0.118, 0.032]	[-0.019, 0.061]	[-0.029, 0.022]
N-Pow	−0.066	0.021	−0.002
	[-0.169, 0.022]	[-0.025, 0.091]	[-0.060, 0.041]

Notes: Unstandardized coefficients. Bootstrapped confidence interval in brackets. Sample size = 180 (listwise) for PL and CI and 179 (listwise) for OE.

three motives on PSIM and PSIP, respectively, through the three value strategies. Despite several significant direct effects of different motives on PSIM and PSIP, on the one hand, and different motives on different value strategies, on the other hand, we only find a significant indirect effect of N-Ach on PSIP through PL (b = 0.10, BCa CI [0.00, 0.22]). This shows there is complementary mediation, which means that the mediated effect and direct effect both exist (Zhao, Lynch, & Chen, 2010), between the achievement motive and the likelihood of decision-makers developing a plan for PSI through product leadership. Fig. 2 visualizes this mediation result in more detail.

5. Theory development

As the third and final step of our abductive approach, we formulate hypotheses based on the empirical test and provide plausible theoretical explanations based on the consulted literature as well as our own prior work.

First, we find that decision-makers driven by the need to achieve are more likely to opt for a product leadership position, which leads them to subsequently integrating products and services into solutions for customers. The preference of achievement-driven people for a product leadership position can be explained by their tendency to compete through clever innovation and prestige branding (Miller & Toulouse, 1986). Also, achievement-driven people are more risk-averse (Miller & Toulouse, 1986) and prefer centralized organizational structures (Miller & Dröge, 1986). Therefore, they are probably more inclined towards solution strategies that lie close to the current business, thus extending existing products with innovative services (or vice versa). On top of this, we find that achievement-driven people are more likely to turn strategic intensions into concrete plans, which allows them to better monitor, control and take credit for their firm's transition into solutions (Miller & Dröge, 1986). An example that exhibits all these elements is the case of a switchboard manufacturer's new owner who started to gradually add preventive maintenance and upgrade services for its panels, and promoted the company as "probably the best panel builder in the world" (Coreynen et al., 2018).

Despite the positive associations between the need for achievement and PSI, on the one hand, and the need for achievement and customer intimacy, on the other hand, we do not find a mediation effect for the achievement motive on PSI through customer intimacy. This type of outcome whereby the direct effect exists but not the indirect effect, is known as "direct-only non-mediation" (Zhao et al., 2010). One explanation is that servitization may not be a desirable choice for achievement-driven decision-makers opting for a customer intimate strategy. Customer-intimate PSI requires firms to pay more attention to customers' broader needs (Treacy & Wiersema, 1993), for example by taking over specific administrative or logistical tasks (Matthyssens & Vandenbempt, 2008), rather than simply servicing products. It requires them to develop a whole new range of skills, such as big-picture thinking instead of focusing on the details (Ulaga & Loveland, 2014), and the ability to learn from customers to co-create value (Kohtamäki & Partanen, 2016). This may lie beyond the interest (and perhaps also the capacity) of achievement-driven decision-makers, who—as we discussed earlier—are more oriented towards PSI for the purpose of product leadership. For example, the switchboard manufacturer's new owner later discontinued the company's web application that supported small-sized installers to configure and order panels online (Coreynen et al., 2017). Therefore, providing an answer to this paper's two research questions, we propose the following two hypotheses, respectively:

Hypothesis 1a. *Decision-makers driven by the need for achievement are likely to pursue PSI.*

Hypothesis 2a. *Decision-makers driven by the need for achievement are likely to pursue PSI if they opt for product leadership.*

Second, concerning the affiliation motive, we find a direct effect of the need for affiliation on PSI. Decision-makers motivated by affiliation are thus likely to consider moving towards integrated solutions important for the firm, and also plan accordingly. This is in line with earlier evidence regarding the tendency of affiliation-driven people to help customers (Lenka et al., 2018; McClelland & Burnham, 2003), and also the observation that people who are inclined to help others are better at selling and delivering services (Ulaga & Loveland, 2014). Yet we do not find a significant relationship between the need for affiliation and any of the three value strategies, nor do we find a mediation effect

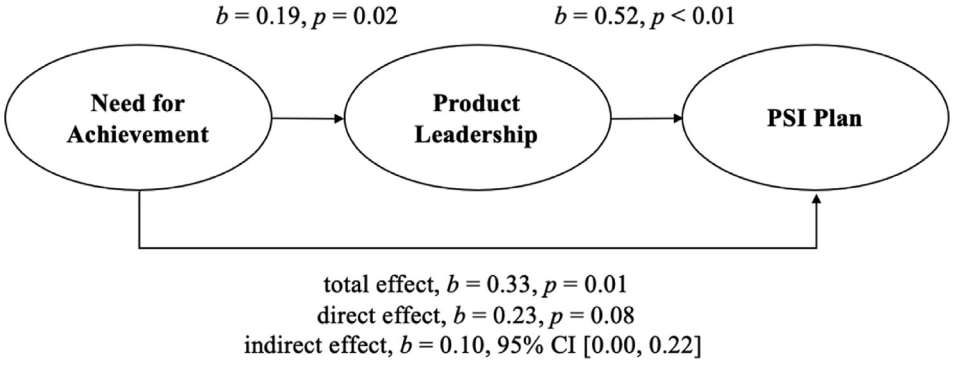

Fig. 2. Mediation results N-Ach on PSIP through PL.

on servitization through either product leadership, customer intimacy, or operational excellence. In other words, we find a direct-only non-mediation effect of the affiliative motive on PSI. Therefore, affiliative managers seem, indeed, less effective than their achievement-driven counterparts to translate PSI ideas (even plans) into corporate strategy (McClelland & Burnham, 2003). A potential explanation is that firms often venture into servitization based on only a handful of customer requests, but fail to incorporate it into their strategy later (Kastalli & Van Looy, 2013). For example, for a prior research project, we worked with a small, local security systems supplier whose owner often explored new ideas on behalf of close customers, such as data analysis services based on camera footage, but later failed to develop them further for the market (Coreynen et al., 2018). The members of his team also expressed confusion about the company's strategic position, which seems to combine elements of both customer intimacy and operational excellence. The need for affiliation alone may thus not be sufficient to develop a successful strategy leading to servitization. Therefore, we propose the following hypotheses answering our two research questions, respectively:

Hypothesis 1b. *Decision-makers driven by the need for affiliation are likely to pursue PSI.*

Hypothesis 2b. *Decision-makers driven by the need for affiliation are likely to pursue PSI, though not to implement a particular type of value strategy.*

Third, concerning the power motive, contrary to the need for achievement and need for affiliation, we do not find a direct effect between the need for power and PSI. Decision-makers driven by power are thus not likely to consider PSI an important trend, and are therefore also not likely to plan doing so. This result where neither a direct nor an indirect effect exists, is called "no-effect non-mediation" (Zhao et al., 2010). Interestingly, we do find significant associations between the need for power and two value strategies, namely a positive effect on operational excellence and a negative effect on product leadership. Power-driven decision-makers are thus more likely to pursue a strategy related to offering customers value-for-money goods and services, and they are less likely to pursue a highly innovative strategy. One possible explanation is that power-driven people prefer using their influence to improve efficiency and reduce costs (McClelland & Burnham, 2003), which is more in line with an operational excellence philosophy (Treacy & Wiersema, 1993). Therefore, they are likely discouraged by the investments necessary to develop new, complementary products, services or customer-centric solutions over which they have less control due to the fast-changing nature of innovations (Fang, Palmatier & Steenkamp 2008; Kastalli & Van Looy, 2013). We observed this in the case of a metal component supplier where the new CEO later reversed the course of the company from providing digital printing solutions to simply supplying metalwork for a variety of industries (Coreynen et al., 2017). Motivation may thus also provide plausible explanations for deservitization (Kowalkowski, Gebauer, Kamp, et al., 2017; Valtakoski, 2017). Since we do not find a significant relationship between the power motive and servitization, nor a mediation effect, we formulate null hypotheses to answer our research questions here:

Hypothesis 1c. *Decision-makers driven by the need for power are not likely to pursue PSI.*

Hypothesis 2c. *Decision-makers driven by need for power are not likely to pursue PSI, even if they opt for operational excellence.*

6. Conclusions

Despite the evidence that people's motives either inhibit or support service growth (Gebauer et al., 2010; Gebauer & Fleisch, 2007; Kreye, 2016; Ulaga & Loveland, 2014), the servitization literature thus far has paid little attention to the microfoundational drivers for PSI (Lenka et al., 2018; Valtakoski, 2017). By drawing from the rich behavioral strategy tradition (Powell et al., 2011), this study feeds two birds with one scone. First, it contributes to the servitization literature by uncovering what motives drive decision-makers to integrate products and services into value-added solutions for customers (Matthyssens & Vandenbempt, 2008). We further extend prior work on motivations for servitization, which has focused primarily on the firm-level (Baines & s., Lightfoot, H. w., Benedettini, O., & Kay, J. m. , 2009; Raddats et al., 2016), by exploring whether people driven by different motives are more (or less) likely to pursue PSI. Second, this study offers a new and nuanced view of the relationship between different motives and organizational behavior (i.e., servitization, in this case) by considering decision-makers' preference for different business strategies. Following an abductive approach, we connect insights from servitization research with human motivation theory (McClelland, 1987) and value strategy theory (Treacy & Wiersema, 1993) to create a conceptual mediation framework. After a comprehensive exploratory analysis, we found that different motives are, indeed, associated with decision-makers pursuing PSI (Kreye, 2016; Ulaga & Loveland, 2014), and that value strategies can serve as a mediator variable. In particular, we found that the need for achievement and affiliation are both associated with PSI, and that achievement-driven decision-makers pursue PSI if they opt for product leadership, whereas those driven by power are not likely to pursue PSI since they are more oriented towards operational excellence. Based on this study's findings, the available literature and our own prior work, we propose several potential theoretical explanations and offer six hypotheses (i.e., three per research question) as input for later research.

The findings of this study offer several remote practical implications. For instance, they provide insights related to the training of both managers and employees in charge of a firm's PSI transition. Though the psychology literature points out that people's motives are shaped in the early years of their childhood, forming the foundation of their personality (Winter, John, Stewart, Klohnen, & Duncan, 1998), people can be stimulated to take more entrepreneurial action towards servitization. For that purpose, we suggest two types of training. The first training could focus on how to successfully develop an integrated-solutions business, covering the basics of servitization knowledge such as the potential benefits for firms (e.g., Baines & s., Lightfoot, H. w., Benedettini, O., & Kay, J. m. , 2009), the different types of offerings (e.g., Brax & Visintin, 2017), and also the most important capabilities that firms will need to develop (e.g., Raddats et al., 2019; Rönnberg Sjödin et al., 2016). This may convince people, particularly those with cognitive barriers (Gebauer et al., 2005), that moving into service can be a successful (perhaps even necessary) option to execute a differentiating value strategy. The second training can be a psychological one, whereby people receive insights in their motivational structure as well as personality (e.g., Lee & Ashton, 2004) and learn how to take initiative, set goals, and persist in the face of setbacks. For example in sports, it has been found that 45 min of psychological skills training (PST) per week increases performance (Sheard & Golby, 2006). In business, psychological training is also found to be more effective than traditional business training (Frese, Gielnik, & Mensmann, 2016).

This study has some limitations that signal opportunities for further research. For one, the single-item variables related to PSI (i.e., PSIM and PSIP) offer only limited insights in the content of servitization. Although the present study is one of the few to contribute to the microfoundations of servitization, it only scratches the surface of the influence of individual-level factors on firm-level servitization decisions. Another shortcoming is that the *F*-statistics for several models are not significant—the cause most likely being omitted-variable bias. Other associations may be worth further investigation. For instance, in this study we only investigated the direct effect of people's single motives on PSI. Future research could further investigate the combined effect of different motives by estimating the impact of moderation (Venkatraman, 1989) on the likelihood of decision-makers pursuing servitization. For example, prior research found that the need for power

together with affiliation leads to higher leadership performance (Steinmann et al., 2015)—perhaps further investigation into the combined effect of different motives could further uncover the relationships between decision-makers' motives and PSI.

Declarations of interest

None.

Acknowledgements

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Appendix

A. Factor analysis results for the motives items

	CFA		
	Factor 1	Factor 2	Factor 3
Need for Achievement			
N-Ach item 1	−0.192	0.089	**0.585**
N-Ach item 2	0.149	0.158	**0.489**
N-Ach item 3 (*)	–	–	–
N-Ach item 4 (rc)	−0.058	−0.156	**0.384**
N-Ach item 5 (rc)	0.206	−0.006	**0.367**
N-Ach item 6 (rc) (*)	–	–	–
N-Ach item 7 (*)	–	–	–
N-Ach item 8	0.014	0.126	**0.567**
N-Ach item 9	0.096	0.313	**0.593**
N-Ach item 10	−0.035	0.046	**0.575**
N-Ach item 11	−0.015	0.277	**0.469**
Need for Affiliation			
N-Aff item 1 (rc)	**0.741**	−0.001	0.102
N-Aff item 2 (rc)	**0.444**	−0.143	−0.044
N-Aff item 3 (rc)	**0.701**	0/119	−0.001
N-Aff item 4	**0.561**	0.238	0.017
N-Aff item 5	**0.718**	0.187	0.150
N-Aff item 6	**0.629**	0.164	−0.038
N-Aff item 7 (rc) (*)	–	–	–
N-Aff item 8 (rc)	**0.755**	−0.051	0.063
N-Aff item 9 (rc)	**0.680**	0.003	−0.030
N-Aff item 10 (rc)	**0.560**	0.083	−0.123
N-Aff item 11 (rc)	**0.581**	−0.008	0.094
Need for Power			
N-Pow item 1	0.217	**0.402**	0.223
N-Pow item 2	0.199	**0.317**	0.170
N-Pow item 3	−0.012	**0.666**	0.211
N-Pow item 4 (rc)	0.167	**0.617**	0.100
N-Pow item 5 (rc)	0.043	**0.469**	0.098
N-Pow item 6 (rc)	0.120	**0.537**	−0.116
N-Pow item 7	−0.027	**0.542**	0.070
N-Pow item 8	0.033	**0.688**	−0.029
N-Pow item 9	−0.075	**0.486**	0.299
N-Pow item 10	−0.071	**0.695**	0.089
N-Pow item 11 (*)	–	–	–

Notes: Items adopted from the PRF (Jackson, 1984). Extraction method: Principal Component Analysis. Number of factors to extract: 3. Rotation method: Oblimin with Kaiser Normalization. Total percentage of variance explained: 35.94%. Reverse-coded items marked by (rc). Removed items marked by (*).

B. Factor analysis results for the value strategy items

	CFA		
	Factor 1	Factor 2	Factor 3
Product Leadership			
1. We continuously refine and improve existing products or services.	**0.671**	0.354	0.093
2. We have a high share of new products or services in our product portfolio.	**0.819**	0.055	0.046
3. We undertake new product or service development above the industry average.	**0.839**	0.135	0.085
4. The design and functionality of our products or services is crucial to our competitive positioning.	**0.700**	0.001	0.288
5. Our brand is different from other brands in terms of actual product or service attributes. (*)	–	–	–
6. Our brand is different from other brands in terms of overall perceived quality of the product or service. (*)	–	–	–
Customer Intimacy			

1. Our firm's strategy to achieve competitive advantage is based on our thorough understanding of our customers' needs.	0.385	0.302	**0.471**
2. We design or produce our products or services to order.	0.030	0.312	**0.651**
Orders are packaged and shipped and/or services are delivered in a way appropriate to each customer.	0.052	0.123	**0.707**
3. A key criterion for evaluating those of our employees who come in contact with our customers is the quality of customer relationships.	0.072	−0.073	**0.697**
4. Our employees are encouraged to focus on customer relationships.	0.184	0.006	**0.528**
5. We conduct advertising at a level above the industry average. (*)	–	–	–
6. We conduct promotions at a level above the industry average. (*)	–	–	–
Operational Excellence			
1. We continuously improve our processes in order to keep costs low.	0.164	**0.857**	0.112
2. We are constantly improving our operating efficiency.	0.254	**0.835**	0.147
3. We continuously strive for product or service cost reduction.	0.014	**0.814**	0.084

Notes: Extraction method: Principal Component Analysis. Number of factors to extract: 3. Rotation method: Oblimin with Kaiser Normalization. Total percentage of variance explained: 56.09%. Removed items marked by (*).

C. Crosstabs product-service orientation (F-PSO) × NACE codes

Sector	P-oriented	Mostly P-oriented	P&S-oriented	Mostly S-oriented	S-oriented	Total
Wholesale & retail trade	10	23	21	4	3	61
Professional, scientific and technical activities	1	4	6	8	9	28
Manufacturing	7	11	7	1	1	27
Construction	3	5	10	2	0	20
Other sectors	1	6	14	10	18	49
Total	22	49	58	25	31	185

Notes: P = product; S = service. Other sectors with more than 5 firms in our sample include information and communication (n = 13), other service activities (n = 9) and administrative and support service activities (n = 8). In total, 185 respondents answered the F-PSO question, which is more than the final sample of 178 cases for which also the other model variables are available.

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